Item C Traffic and Parking with Attachments (Revised 10/30/07)

INTRODUCTION

A. Parking

In evaluating alternative parking locations to serve customers and employee in Newton Centre, the following criteria governed:

Constrains:

1. Assumed that only City or Government Agency[1] owned property is available.
2. Assumed that Eminent Domain is not an option.
3. Assumed that negotiations, with private property owners, can occur and result in benefits for customers, merchants, owners and the City.

Basic Parking Location Strategy:

1. Place longer term parking at the perimeter of Newton Centre eliminating the need for traffic, destined for the Centre, to enter the central shopping area.
2. Reserve street parking for customers' short-term parking using "Credit Card" meters or meters with increasing per time period rates.

Mitigation:

1. All Task Force Groups agreed that surface parking in the Triangle must be eliminated allowing the three commercial sub-areas in Newton Centre to form a "Village Centre".
2. Locations for temporary replacement parking has been identified that will allow construction or building(s) and a pedestrian plaza on the Triangle.

Brief Summary of Locations Considered for Parking Structures:

1. Northerly: Seemingly the easily area to locate a parking structure, it has, however, proved to the most difficult. Many Task Force members felt that the parking area behind the Langley Road shops would be an ideal location but at least one owner raised strong objections. While there could be density bonuses for owners, apparently there is no interest.

   At this time, many innovative approaches and two meetings with the MWRA resulted in the conclusion that construction on or over the Sudbury Aqueduct imposed costly construction restrictions and functional impediments. However, if the Aqueduct is abandoned or if a "by-pass" for the function of the Aqueduct is possible, this site must be reconsidered.

   Replacing the Fire Station and Fire Headquarters buildings were considered but relocation sites for these facilities could not be identified, cost for replacement were a consideration, and, in any case, the location for customers was distant until the Langley Block was fully developed.

   An underground garage below the northerly Green (the site for summer concerts) was investigated and legal restriction on use as well as width of the site proved to be limiting

[1] Meetings occurred with the MWRA and the MBTA. Memo regarding these meetings are attached.

factors.

Therefore, unless negotiations with the property owners on Langley Road are undertaken and are successful or the Adquaduct is no longer required, the only remaining location for parking is below the Triangle in an underground garage. This is not in keeping with the Basic Parking Location Strategy but there is no other option.

2. Southerly: The existing Cypress Street Lot and air rights over the adjacent MBTA right-of-way allows a structure to be located on public property. The location can be enhanced through negotations with the owner of the Herrick Street apartment building and/or the owner of the "Learning Express" building.

   This location is convenient to shops on the southerly side of Newton Centre, the MBTA Station and any shops located on the Triangle.

3. Westerly: This is only available site totally under City ownership. The impediment, however, is *perceived traffic impact* on adjacent neighborhoods. *By designing a parking structure that is only accessible from Centre Street, the existing and any future traffic impact on neighbors living on Pelham, Pleasant or Crescent Streets can be reduced.*

   There are two options under consideration. The first, envisions a parking structure utilizing City property on either side of Pelham Street. The second envisions a taller structure south of Pelham Street with the City Property north of Pelham devoted to housing.

4. Easterly: Since there is no publicly owned, property on the East side of the Centre, no public parking site is available. It is recommended that the City undertake two actions: first, negotiate with the owners of the existing private parking areas to see if shared parking during the day or in the evening when shops are closed would be acceptable and second, be prepared to purchase property on the east side if any becomes available.

B. TRAFFIC

There are two key recommendations regarding traffic:

1. Reduce the traffic volume by eliminating the need for vehicles to enter the central area of Newton Centre to find parking for shopping, business, or work. Use "Credit Card" meters to price the remaining short-term street parking at an increasing per hour rate[2].
2. Construct "Urban Round-About" at Beacon and Centre Streets and at Beacon, Langley and Sumner Streets. This will allow continuous flow of traffic automatically adjusting for changing directional traffic flows

[2] For example, the first 20 minutes could be free after swiping your credit card; the second 20 minutes would be $5.00 and the third 20 minutes and thereafter would be $10.00 per 20-minute period. If "Credit Card" meters are unavailable other meters with increasing rates per period are suggested.

PARKING

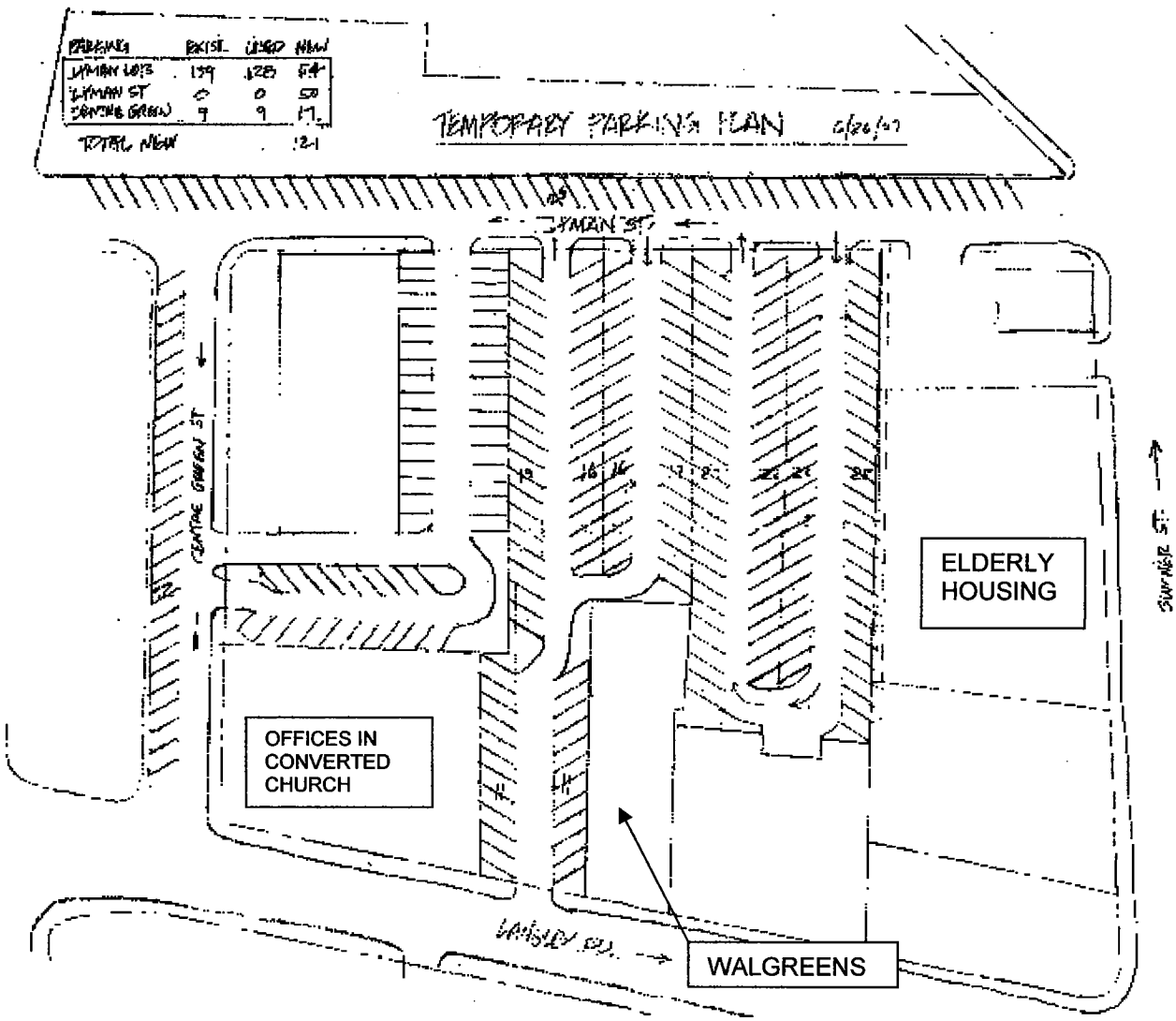
Proposed changes in "The Triangle" will require relocation of existing parking. A key strategy for "finding" new spaces has included conversion of parallel parking spaces to diagonal spaces and sharing of parking spaces on private property. *Combined Groups Two and Three supports use of diagonals where they do not degrade the pedestrian experience or local circulation.* However, there is concern that too much diagonal parking or improperly placed diagonal spaces can cause conflicts that will endanger pedestrians and be detrimental to the center. In addition, Combined Group Two and Three generally favors use of the public right-of-way for wider sidewalks and landscaped medians rather than for maximizing parking on the streets. Groups Two and Three proposes some modest additions to on-street parking and parking structures for better use of available land to meet a variety of parking needs.

Replacement Parking

When "The Triangle" is made into a public space, replacement parking could be located in several places:

- Lyman Street. This street has a low volume and can tolerate delays that may occur with the addition of 35-40 new parking spaces. Because spaces are accessible from the rear of stores and on the perimeter of the center, they should be designated as long-term spaces to improve employee options. If it is not possible to widen Lyman Street to accommodate diagonal parking, consideration should be given to making it a one-way street so additional parking can still be provided there.[3]
- The private surface parking lots behind buildings that front onto Langley Road (and are accessed off of Lyman Street). Re-grading and repaving of these sites as shown below could result in as many as 50 new parking spaces. Public use of the new spaces would need to be secured and businesses could continue to have use of the spaces for their staff and patrons. Short-term spaces are recommended closest to the shops and long-term spaces designated to the rear of the lots. At least one owner did not reject this idea and indicated that it would be considered. When the construction of a parking garage is complete, parking spaces between Lyman Street and Langley Road would be returned to private use unless some other arrangement for public/private use is negotiated.

[3] Review of traffic circulation revealed that fire engines heading south from the station on Willow Street typically circle the block and go down Langley Road. Changing the direction of Langley Road and Sumner Street could improve fire response time by allowing more direct access to the intersection at Langley Road and Beacon Street. Langley Road would flow from east to west (Sumner to Centre) with a right turn only allowed at Centre Street. Sumner Street where Lyman and Willow meet and Langley would run north to south. If Lyman were to become a one-way street to accommodate more parking, the streets could allow circulation in a single direction and good access to all points along the way. These changes appears to have no observed negative impacts on the center.



- Centre Green Street. Approximately 15 diagonal spaces can be provided on the west side of the street where there are no curb cuts. This also is a low-volume street and diagonals should not pose any problems there.
- Centre Street between Gibbs Street and Tyler Terrace. Between 8-12 parking spaces can be added to the west side. Since they would not be in front of any shops and are peripheral to the center, they could be useful for long-term employee parking.
- Private lots, especially those used by churches and some offices. To acquire the remainder of the 155 replacement parking spaces, the group supports requesting a temporary waiver of

parking requirements to allow use of church and/or office parking spaces at times when they are not otherwise in use.

- Langley Road. Diagonal spaces on the north side and elimination of parallel spaces on the south side would not increase the number of spaces, but would place them nearest the stores for easiest access during and after construction. This would be safer for pedestrians because now they often jaywalk if their cars are parked across the street. Since cars backing out of traditional diagonals have limited visibility, this poses a safety hazard. Back-in diagonals are recommended instead because they allow drivers to see the street when they exit and also allow for rear loading from the sidewalk.

Future Parking Demand

If more active space is added to the center of "The Triangle," parking demand is likely to increase. The uses and scale of additions will determine future parking needs. For instance, consider projects that range in scale from 30,000 to 50,000 and include some restaurant, some retail and possibly some community space (see appendix for detailed description and parking calculations). Depending on the method used to calculate parking requirements, the range of required spaces varies widely. If the nature of uses is similar in parking demand to those already in Newton Centre and the current ratio of gross floor area is applied to the future uses, the requirement for parking will be very low (between 35 and 58 spaces for 30,000-50,000 square feet of new floor area). If the City's Zoning Regulations are applied, 239-556 spaces would be required for the same square footages. A third method that computes parking based on the mixture of uses and the likelihood that people will park once and visit several places such as in shopping center, yields a requirement of 108-200 parking spaces for the same projects.

Census data and Newton Centre merchant surveys show that between 65% and 75% of employees drive to work and anecdotal evidence suggests that nearby residents often walk. Therefore, it is recommended that the City's parking requirements for Newton Centre be multiplied by a factor of .7 (70%) to adjust for availability and active use of transit. With this adjustment, the parking requirements would range from 167 spaces for 30,000 sq. ft. to 389 for 50,000 sq. ft. of retail, restaurant and community space.

Additional parking is recommended in strategically-placed public facilities where the spaces can be shared. Parking structures that serve many uses reduce the overall need for individual businesses to provide parking and uses available land more efficiency than when parking is located in multiple surfaces lots. City-owned lots and other public properties are especially appealing sites because they do not require acquisition costs and generally are already well situated for local parking needs. At the present time, there is demand for parking throughout the center, so distributing it evenly and/or providing structures where demand dictates is optimal. As nonconforming uses leave the area, the city should consider purchase of land for possible future parking, especially on the east side of Newton Centre. Possible develop of City-owned properties is described below. Not all of the options described are viable at the present time, but are noted for their potential to serve current or future parking needs.

ALTERNATIVE PARKING GARAGE LOCATIONS

A. Underground Parking and Development of the Triangle

After analyzing and discussing the various alternatives, parking under "The Triangle" is now the default location to satisfy the present and some modest future demand. Approximately 90-95 spaces can be provided per floor and two floors will more than replace the spaces that currently exist on the site. Because they are in the "prime" location ~ close to shops and the proposed new public space above it ~ they should be the highest priced spaces to discourage use by long-term parkers and ensure availability for consumers.

While parking under the triangle is the default location, the following items were considered as benefits to this conclusion:

People already gravitate towards "The Triangle" and if spaces are easily accessible and well-managed, a driver entering the structure would be more likely to find a space and circulating traffic would be contained within the facility and not on the street. Well-placed access points that allow through traffic to pass without conflicts with cars searching for parking will control congestion on the streets. By keeping parking on the streets to a minimum, sidewalks can be wider and the pedestrian experience given priority.

Whether on the street or in additional structures, long-term parking spaces on the perimeter will capture most employees before they enter "The Triangle" area and relieve it of some of the current demands.

Underground parking is more costly; for each level down parking goes, the cost increases in contrast to above-ground parking in which the cost per floor is fairly stable. For financial reasons, it may be necessary to limit the size of the structure to two floors.

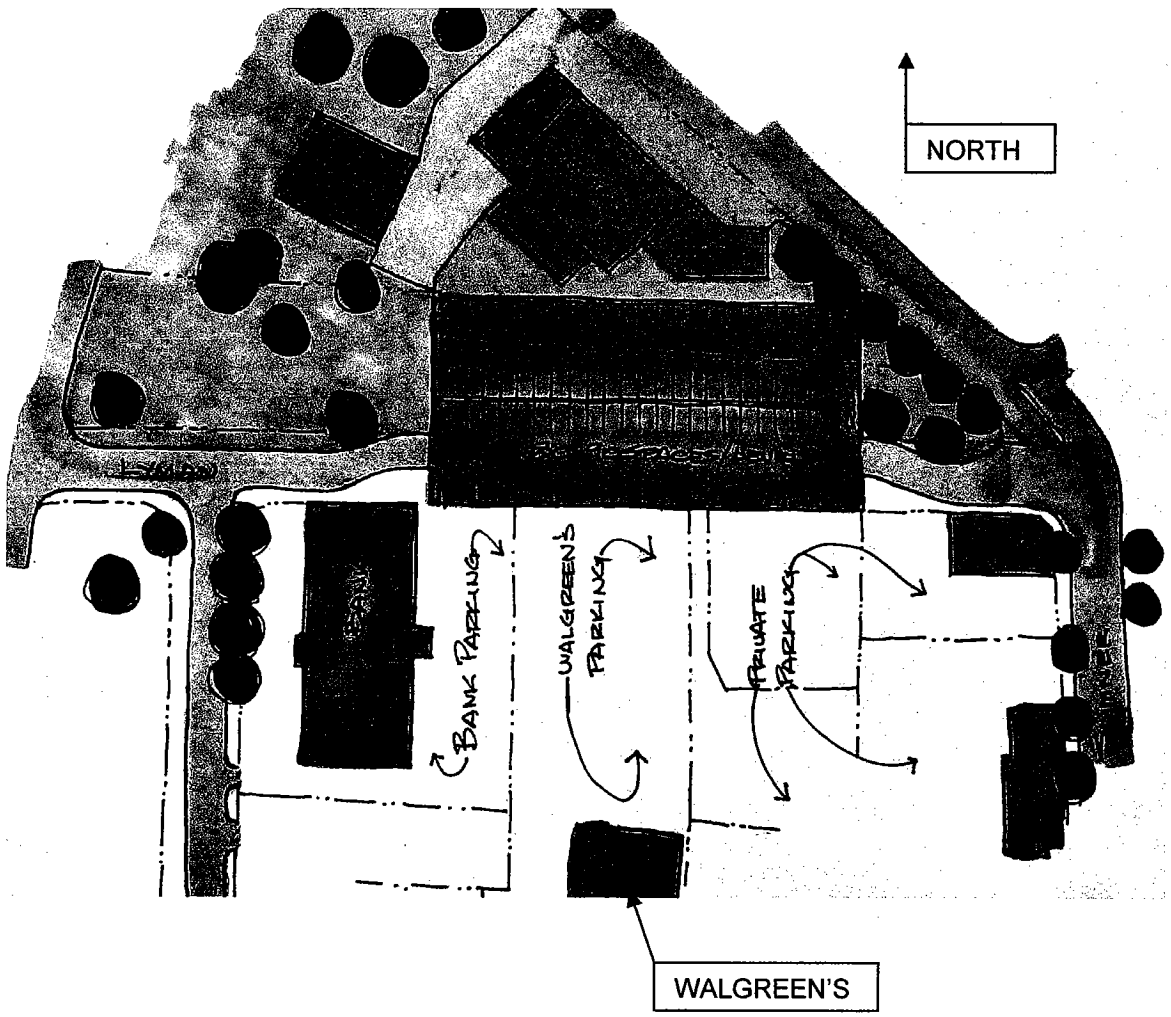
Financing for approximately 190 parking spaces at $50,000 per space would cost an estimated $10 million. If financed by bonds and repaid over 10 years, the annual cost would be approximately $1 million. Parking meter revenues currently generate about $520,000 in Newton Centre. If additional parking spaces are added, parking rates are increased and citation revenues are included, it is possible to generate the necessary capital to repay bonds. Since parking in Newton Centre is also heavily used in the evenings during BC football and Red Sox seasons, extending the hours of operation of meters could be used to manage parking and also could generate additional revenue.

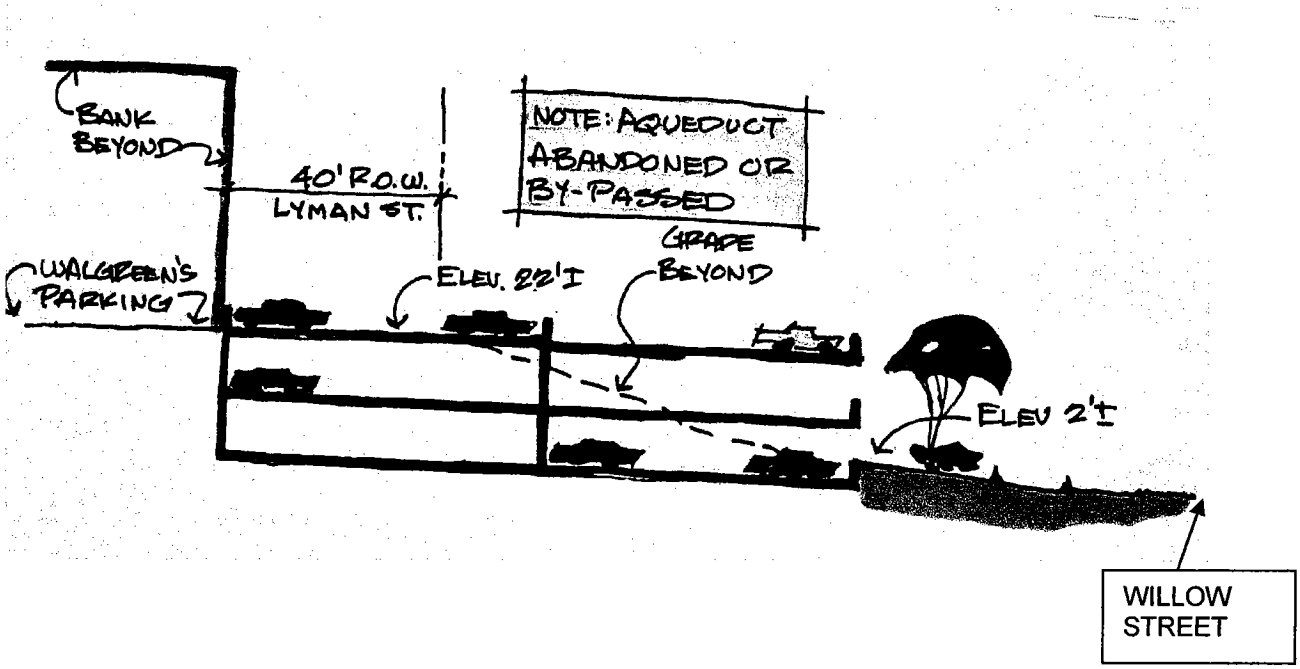
The conceptual design is efficient because it is rectangular and does not extend under the adjacent streets so, streets would remain open for circulating traffic during construction. Replacement parking behind the Langley Road shops would be in place before construction begins so existing businesses on Langley Road can be reached by either Langley Road or Lyman Street.

B. **Lyman Street as an Alternative**

As previously discussed, options to build a sizable structure are limited by placement of the

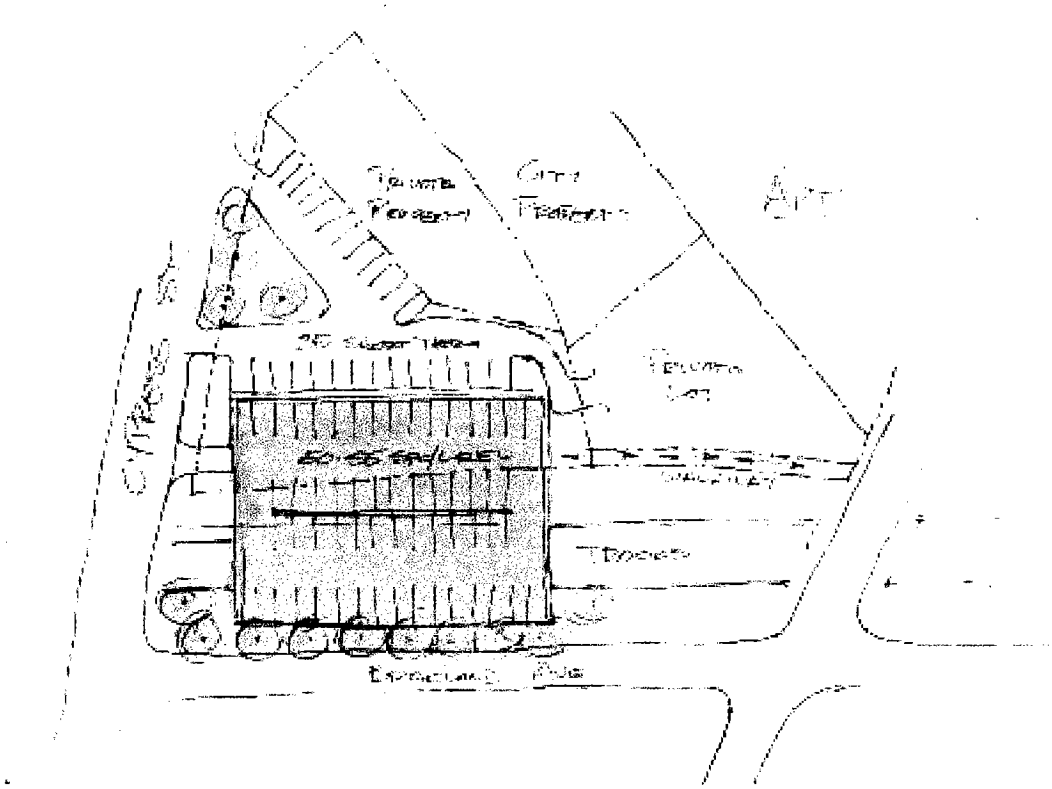
existing aqueduct located 10 feet underground and running parallel to Lyman Street on MWRA property. The aqueduct is currently maintained as a backup system and it is possible that within the next 10 years, it may be abandoned and the potential to develop a structure into the slope of the hillside can be considered. In addition, it may be possible to provide a "by-pass" or otherwise construct on this site.



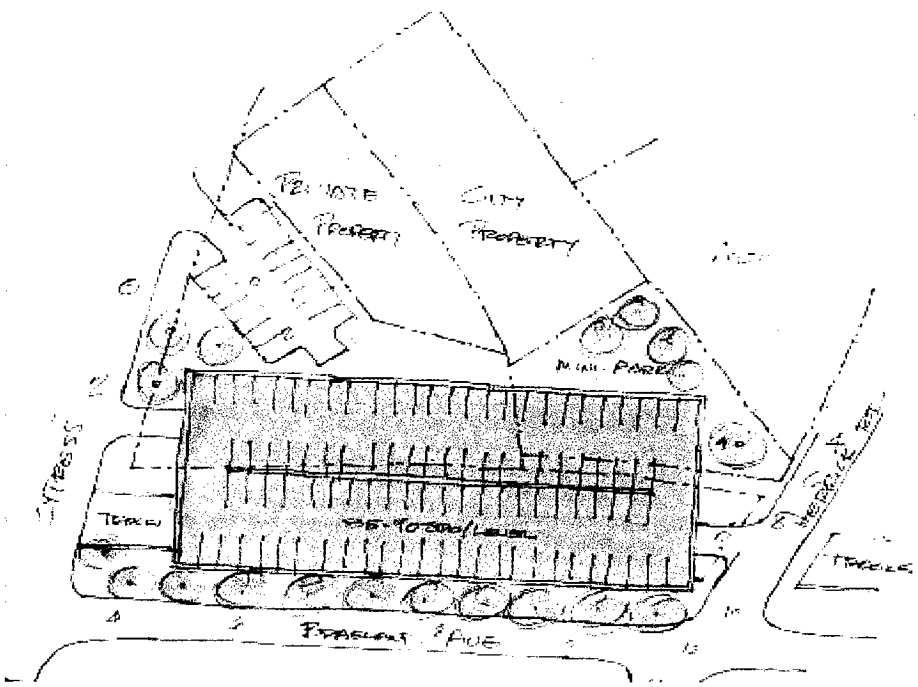


C. **Cypress Street Lot for Long-Term Parkers.** The Cypress Street lot serves both commuters and employees and additional levels of parking on this site would have minimal impact on residents. Braeland Street separates the MBTA tracks from existing residences and there is only one house that faces Braeland Street adjacent to the site. In July 2007, MBTA representatives expressed a willingness to allow the City to encroach over MBTA property contingent upon some compensation in the way of additional revenue and/or commuter parking.

Design A (below) offers the benefit of retaining the surface lot for short-term parking that serves customers to the area. It extends over the tracks and will provide a sound buffer to adjacent businesses and residents. Design of the building will need to be sensitive to those as well and landscaping along Braeland Street to complement the streetscape and screen the building is recommended. The use of private properties is not needed to construct such a building and access to an adjacent private lot is maintained. The existing path to the MBTA station would remain in its current location. This structure could house between 50-55 spaces per floor.



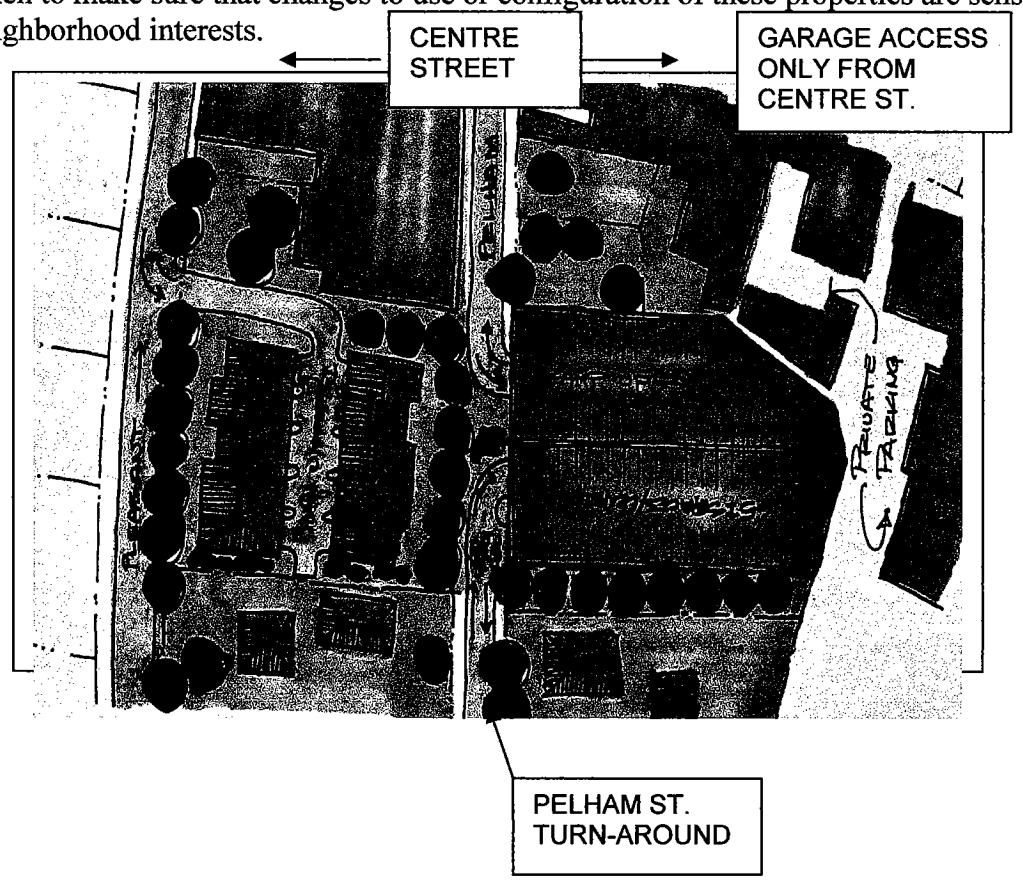
CYPRESS STREET DESIGN A



CYPRESS STREET DESIGN B

To achieve a greater number of parking spaces yet retain a building height that is compatible with those of surrounding buildings, Design B shows a longer structure. This structure also spans MBTA property and encroaches on a corner of the private parking lot to the northeast. It retains some short-term parking in a surface lot to the northwest. It offers the option of access from Cypress Street and/or Herrick Road which could serve to distribute traffic at two points. Again, landscape screening and context-sensitive building design would be required to assure the facility is a good neighbor. Due to the greater coverage of the tracks, it would offer more sound attenuation than the smaller structure. This design offers 85-90 parking spaces per floor. Parking for adjacent private property would need to be provided, possibly within the structure.

D. **Pelham/Pleasant Street Parking and Housing. Because of their proximity to residential** areas, both of these City lots were considered last. However, all sites considered have their limitations and the options given aim to resolve previous concerns. Special care must be taken to make sure that changes to use or configuration of these properties are sensitive to neighborhood interests.



A building of less than 30 feet in height on Pelham Street could provide 200 to 250 spaces in 3-4 levels; placing one level underground would further decrease its scale. There is ample space to include a ten-foot landscape buffer adjacent to residential property. The residential portion of the street could be returned to a two-way street with a cul-de-sac abutting the parking structure and guest parking for residences also could be provided at the turnaround or in a portion of the parking structure. Pedestrian access would be provided for residents. If parking is consolidated on the Pelham Street site, then the Pleasant Street lot could be converted to two-story housing units as a transition to the commercial area on Centre Street.

The site would include residential landscaping and an ample side yard setback could be provided. No changes to the street are proposed on Pleasant Street, but a one-way loop could be created to from Pelham to Pleasant Street and back out to Centre Street where right turns only would be allowed. This circulation pattern would minimize conflicts by allowing entry and existing only off of Centre Street.

E. **Centre Green Street**

Despite the fact that this land has been altered in the past, State and local laws protects this City park with historic significance and several reviews would be needed to approve changes at this site. However, the location of Centre Green presents a good place for providing underground parking, since it is close to the shops and would be convenient for both shoppers and employees and the size allows for a structure with optimal dimensions. Disruption to the grounds would occur during construction under the green but could be restored to its original condition afterwards. State and local approval would be required to pursue this option and a key question is whether the laws that apply to activities on the ground also preclude improvements beneath it, even if the land is restored to its condition before construction.

F. **Private properties**

Private properties are not currently listed among possible sites for future parking, either. Since the Task Force first met, the parking lots that exit onto Lyman Street (behind Walgreens) have been viewed as attractive for providing parking in an efficient structure that would not impact the streetscape. Four different property owners that may have differing interests in what they would like to do with their land in the future own the land needed for an efficient structure. All four property owners would need to agree to cooperate in this effort and their own parking requirements would need to be reconciled by means that are not currently available to them (such as being permitted to pay fees in lieu of providing on-site parking or by exchanging land for use of parking spaces in a new structure, for example). A joint venture between the City and property owners may still be a strategy worth exploring, but has not been pursued by the Task Force at this time because of early indications that at least one of the property owners is not interested such a collaboration.

PARKING CALCULATIONS

Gross Floor Area Proposed	1 space/866 square feet of GFA[4]	Mixed use formula[5]	Newton Zoning Regulations[6]	Zoning Regs x .7
50,000 square feet • 25,000 restaurant • 25,000 retail TOTAL	 • 29 spaces • 29 spaces 58 spaces	 • 146-160 customer spaces • 35-40 employee spaces 180-200 spaces	(see footnote for assumptions) • 309 spaces • 91 spaces 400 spaces	 280 spaces
50,000 square feet gross floor area • 18,000 restaurant • 18,000 retail • 10,000 community space • 4,000 winter garden TOTAL	 • 21 spaces • 21 spaces • 11 spaces • 5 spaces 58 spaces	 • 150-161 customer spaces • 30-34 employee spaces 180-195 spaces	 • 220 restaurant • 78 retail • 250 community space • 8 winter garden 556 spaces	 389 spaces
30,000 square feet gross floor area • 15,000 restaurant • 15,000 retail TOTAL	 • 17.5 spaces • 17.5 spaces 35 spaces	 • 87-96 customer spaces • 21-24 employee spaces 108-120 spaces	 • 184 spaces/ restaurant • 55 spaces/retail 239 spaces	 167 spaces
30,000 square feet gross floor area • 9,600 restaurant • 9,600 retail • 8,400 community space • 2,400 winter garden TOTAL	 • 11 spaces • 11 spaces • 10 spaces • 3 spaces 35 spaces	 • 99-103 customer spaces • 17-19 employee spaces 116-122 spaces	 • 118 spaces/restaurant • 35 spaces/retail • 210 /community space • 5 spaces/winter garden 368 spaces	 167 spaces

[4] Data provided through the assessor's office for the Newton Centre study area shows totals a gross building area of 821,286 sq. ft. and peak occupancy of 948 spaces (private and public demand combined) or an equivalent of 1 space per 866 square feet of gross building area. If the uses proposed in "The Triangle" have similar parking demand characteristics as those already in Newton Centre, then the future demand for parking would likely be in this range. If there are a greater proportion of high demand uses (such as restaurants and medical offices), then the parking required will be higher than this. Conversely, if low-demand uses dominate (such as bike shops or residences), the parking requirement would be less than this.

[5] This method includes a reduction in parking for uses that complement each other where drivers typically park once and visit several destinations.

[6] See calculations and assumptions in attached appendix.

APPENDIX

Parking Calculations per Newton zoning standards

RESTAURANT CALCULATIONS
Requirement: 1 space/ 3 seats + 1 space/3 employees on largest shift
Assumptions: to estimate number of seats, assumed 20 sq. ft. per customer; to estimate number of employees assumed 1 employee per 200 sq. ft. if customer area; customer area = total square footage minus 1/3 of floor area for prep)

25,000 square foot restaurant
- 8,333 prep area
16,666 customer area (seating, waiting, restrooms)
Estimated number of seats = 833 (@20 sq. ft./customer)
278 parking spaces required per 3 customers
83 staff required to serve @ 1/3 =28 spaces
278 +28 = 309 spaces required

18,000 square feet of restaurant space
-6,000 square feet of prep area
12,000 square feet of customer area = 600 seats @ 20 sq. ft./ customer
200 spaces required @ 1/3 customers
12,000/200 sq. ft = 60 employees/3 = 20 spaces
200 + 20 = 220 spaces required

15,000 square feet restaurant
- 5,000 square feet prep area
10,000 customer area = 500 seats @ 20 sq. ft./customer
500/3 = 167 spaces required
10,000/200 = 50 employees/3 = 17 spaces
167 + 17 = 184 spaces required

9,600 square feet restaurant
- 3,200 square feet prep area
6,400 square feet of customer area
320 seats/3 = 107 spaces
6,400/200 = 32 employees/3 = 11 spaces
107 + 11 = 118 spaces required

RETAIL CALCULATIONS
Requirement: 1 space/300 sq. ft. GFA + 1 space per employee on largest shift
Assumptions: to estimate number of employees assume 1 employee/1,000 sq.

25,000 square feet retail
25,000/300 = 83 spaces for GFA
+ 25,000/1,000 = 25 employees/3 = 8 spaces

83 + 8 = 91 Spaces for Retail

18,000 square feet retail
18,000/300 = 60 spaces for GFA
+ 18,000/1,000 = 18 employees/3 = 6
60 + 6 = 66 Spaces for Retail

15,000 square feet retail
15,000/300 = 50 spaces for GFA
+15,000/1,000 = 15 employees/3 = 5 spaces
50 + 5 = 55 spaces for retail

9,600 square feet retail
9,600/300 = 32 spaces for GFA
+ 9,600/1,000 = 10 employees/3 = 3 spaces
32 + 3 = 35 spaces

COMMUNITY SPACE CALCULATIONS
The general assembly standards of public assembly were applied and include 1 space per seat and 1 space per employee on the largest shift. Staffing is expected to be limited to 1 person to provide access; cleaning staff would arrive after hours so, the primary basis for evaluation is seating. The space is envisioned as multipurpose space, but for purposes of estimating potential occupancy, 1 space 40 square feet of gross floor area is assumed (to allow for seating and non-seating space such as walkways, general gathering space, closets, etc.)

WINTER GARDEN
The Zoning Regulations list no requirement for recreational areas, or public parks so the standard of 1 space per 500 square feet was used.

TRAFFIC

Traffic Calming and Management

As identified in the Consensus Plan, traffic calming and other traffic management modifications are recommended to slow cars and manage traffic flow. The improvements described below could be introduced at any time to improve existing or future conditions.

- Roundabouts at Beacon/Centre and Beacon/Langley intersections to calm traffic and reduce wait time
- Bulb-outs and elevated crosswalk on Beacon Street next to the driveway at the Post Office
- Bulb-outs or mini roundabout at Gibbs Street
- Landscaped boulevard for pedestrians to rest and visually narrow the lanes of travel on Centre Street between Beacon Street and Sumner Street
- Change paving material on crosswalks at roundabouts on Beacon Street at Langley and Centre Street
- Raised mid-block crosswalk and planters or decorative fencing along "The Triangle" to direct foot traffic across Langley Road
- Elimination of merger of Centre and Cypress Streets by 1) separating the two streets with a landscaped median from the point of merger to the proposed roundabout at Beacon/Centre Streets[7]; 2) installing a traffic signal where Cypress and Center streets converge[8]; or installing a mini-roundabout
- Live parking on Union Street in front of the MBTA stop on Union Street from 4:30 – 6:30 pm to reduce double parking and encourage drop off at the "T"
- Live parking on Braeland Avenue adjacent to the MBTA from 4:30 – 6:30 to reduce demands for drop-off and pick-up on Union Street
- Long-term meters on Braeland Avenue to encourage merchant use of spaces and free spaces on Union Street so customers don't need to circulate as much to find parking

One-Way Loop

A one-way loop around Newton Centre also was considered but was found not to be feasible. The proposed loop would have circulated traffic counterclockwise between the intersections of Beacon/Centre Streets, Beacon/Langley/Sumner Streets, and Centre/Sumner Streets. While the one-way loop had the advantages of allowing easier access to diagonal spaces and required less lane width for traffic, the traffic analysis performed by McMahon Associates noted operational problems at the Beacon/Centre Streets signalized intersection. They concluded that "the overall level of service at the intersection is worsened with the redistribution of the traffic volumes with this configuration and is not an improvement to traffic operations at this location."

[7] State approval of the relocation of green space will likely be needed for this alteration which preserves the green space slightly west of its current location.

[8] Funding for a signal at Cypress and Centre Streets is proposed by the Chestnut Hill Square Development Proposal currently under consideration and is listed in the CIP.

Memo for the Record

May 10, 2007

Alderman Vicki Danberg and Committee Member K. Edward Alexander met with Fire Chief Joseph LaCroix

1. Regarding raised crosswalks.
   a) The Chief had a drawing of a design that the Department would accept. The overall width is 20 feet and it is elevated 6 inches. There is a 6-foot slope, then an 8-foot level section, and a 6-foot slope. The level section is critical and could be wider.
   b) He felt that his equipment moved relatively slow in approaching and driving through Newton Centre. Therefore, the 6 inch elevated section described above would not be a problem. In other locations where his trucks are moving faster, the 6-inch rise may be a major problem.
   c) The raised crosswalk must be clearly marked --- yellow paint or something that his drivers can see at night and understand what they are approaching.
   d) Drainage is a concern. If the street slopes (and all of them do), storm water drain must be provided on one side so that 6 inches of water will not collect.
2. Regarding the Fire Station
   a) The "annex", the one story structure at the rear and side of the Station, houses the Ambulance Group's support facilities; the wire groups work shops, cable and supply storage, and equipment storage.
   b) He would like to add a second floor to the "annex" for the above uses.
   c) He would prefer that the Wire Section remain in close proximately to the Fire Department Headquarters for coordination and supervision. He could not suggest an alternative location. The Ambulance facility must remain, as it is an integral part of the operation.
   d) In general, the second floor of the Station (as in most Stations) requires total renovation. Some of the changes are due to the introduction of women fire fighters but the Station is a half-century old and all the systems (heating, electrical, water supply) require an upgrade if not replacement (visual inspection indicates that the windows are not energy efficient but they are not currently schedule for replacement). The first floor, other than the overhead door openings (equipment is taller), is adequate. A/C in the living quarters as well as the administrative area is a modern day requirement.
   e) Not surprisingly, a new station would be acceptable and he suggested a location in the Park across from the Headquarters Building. In other words, he requires a Newton Centre location but the Park is the only location owned by the City that could accommodate the Station.
   f) The Headquarters building continues to function but it is not ideal. I sensed that a new facility is on his dream list.

March 26, 2007
Added names of MWRA Staff 01/15/08

RE: Meeting with the WMRA

1. Alderman V. Danberg and NCTF members Terry Wendt, Ann Hockberg, and K. Edward Alexander met with Jae Kim, Deputy Director, Michael Hornbrook Chief Operating Officer, Ralph Francesconi Project Manager and Maureen McAvoy, Design Manager of the MWRA. Memo written by K. Alexander.
2. Keeping in mind that Engineers are conservative (which cuts both ways); the following is a summary of what I heard during the meeting. Part is what they actually said, and the other is based on experience of dealing with engineers and understanding what they do not say.
3. The MWRA will make a determination as to the long-term viability of the aqueduct but the study and decision will be at least 5 years away and possible 10. Funding and Implementation of the decision and subsequence construction will follow. Unless something like Homeland Security concerns speeds the process, we are looking at 10 to 20 years before the site is available if the decision is made to abandon the aqueduct. If the aqueduct is deemed important as a back up, the constraints on constructing a garage or parking lot are pretty much as they are now.
4. The City would have to assume the Liability for any damaged to the aqueduct.
5. The City would have to negotiate a land lease for the use of the property. It might be $0.00.
6. The aqueduct has a stone foundation and sidewalls but the top is a curved arch made of brick. It must be approaching 100 years old.
7. A parking structure over the aqueduct is very unlikely to receive support from the engineering section of WMRA. (They did say if the lower floor was 15 or more feet above grade, it might be OK but they also know that it is extremely unlikely that the City Fathers would approve such a structure and the neighbors less likely to approve, so the clearance requirement is the equivalent of saying No.)
8. Depending on the depth of the earth cover over the aqueduct, a surface parking lot can be constructed. However, it *may* have to be "bridged" over the aqueduct. Drilled caissons (3 to 4 feet diameter) would be the preferred support if "bridging" were required. Driven piles would not be acceptable. Drilling vibrations would be a concern. One would assume that the caissons would have to be 10 to 15 feet away from the aqueduct, assuming that they could be closer would have to be support by soil condition information and assurances that construction techniques would minimize vibration of the auger. The visual impact from Willow Street becomes an important consideration. Fencing (to prevent people from going under the bridge on the downhill side) and landscaping may mitigate this visual impact.
9. Assuming that "bridging" is *not* required for a surface lot, the location of a retaining wall would probably have to be about 15 feet from the aqueduct due to the construction requirement. Assuming that it could be closer would be very optimistic. The depth of fill over the aqueduct become a concern but it may be possible to have the lot lower than Lyman Street and this would reduce the amount of fill required as well as the height of the retaining wall.

****

I believe we must carefully look at the juxtaposition of this parking lot or structure to possible development of the northerly portion of the Langley Block *especially if Lyman Street becomes part of the parking lot as some propose*.

What is the view of the stores or housing built along Lyman Street? If housing, do people enjoy a tree-lined sidewalk on their walk to the Park? What if they wanted to visit a store on Centre Street, do they walk through a parking lot? What is the view from the housing along Willow Street (and ask oneself if these units were upper income would we even be considering a parking structure or a 15-foot high retaining wall in this location)?

In my judgment, an alternative location for parking needs to be identified on the northerly side of the Centre.

April 25, 2007
Revised April 26, 2007

Memo for the Record

Alderman Vicki Danberg, City Engineer Lou Taverna, Committee Members Terry Wendt & K. Edward Alexander again met with Jay Kim, Deputy Director and Maureen McAvoy, Design Manager of the MWRA to explore way to utilize the MWRA property north of Lyman Street in Newton Centre that might be acceptable to the MWRA. Four optional approaches were identified.

Assumptions:

1. Langley Street 40 foot ROW is an integral part of a surface lot or parking structure for three of the alternatives. By using the Lyman Street, the main building of the Fire Station can remain.
2. The wire storage/communication structure at the rear of the Fire Station is removed in alternative one, two and three as outlined below.
3. Lyman Street will continue to provide truck and vehicular access to the Langley Block therefore; the vertical clearance for any structure over Lyman Street would have to be 14 to 15 feet.
4. The utilities under Lyman Street can either remain in place or be relocated..
5. The Langley Block's property owners will agree to pedestrian ways through their property to Langley Street.
6. A zoning change is adopted requiring a building setback along Langley Street to provide a sidewalk and create a separation between any structure built over Lyman Street and any future buildings in the Lyman Block facing Lyman Street.
7. The vertical height of the retaining wall (18 ft.) on the northerly side (adjacent to the corner of the main building of the Fire Station) or the vertical "closure" is not a visual deterrent.
8. The height of a structure over Lyman Street and extending to the corner of the Fire Station is not a visual deterrent.

1. *Use Lyman Street &15 to 20 feet of the MWRA land for 2 rows of surface parking while retaining service access to the Langley Block. Another two rows of surface parking and parking access would occur further north.*
   a) The existing aqueduct would require protection from any load that could comprise the integrity of the structure.
   b) It may be that soil could be place over the aqueduct without undue loads. A retaining wall of approximately 18 feet is necessary on the northerly side. If the

northerly two rows of parking could be lowered by one or two feet, the height of the retaining wall would be reduced. A fence is required at the top of the retaining wall or the wall could be three or more feet higher.

c) The wire/communication work and storage building behind the Fire Station is eliminated.

d) The retaining wall would pass a few feet from the corner of the Fire Station's main building.

e) If it were determined that the integrity of the aqueduct would be comprised by earthen fill over it, a structural slab over its entire length is necessary. A retaining wall is still required.

f) The MWRA would retain the right to maintain or replace the aqueduct and this would probably require excavation and destruction of any improvements.

g) Approximately 100 to 120 spaces are possible less the spaces eliminate to provide access to the Langley Block.

2. *Place the lower floors of a parking structure fifteen or more feet above the MWRA property.*

a) Use the 40-foot ROW of Lyman Street for access to the Langley Block and one row of surface parking. Then place a two level parking structure over Lyman Street and the MWRA property and provide clearance of at least 15 feet. The open area under the multiple levels structure would allow the MWRA to access the aqueduct with heavy equipment for repair or replacement. (Note: Clearance for truck access to the Langley Block will require a 14 to 15 foot for any structure placed over Lyman Street therefore this requirement is not onerous, as it seems.).

b) Columns for a multi-level structure require carefully placement so that damage to the existing aqueduct does not occur. Column placement would also have to consider the requirement for the operation of heavy equipment.

c) The required clearance over the aqueduct is approximately fifteen feet. However, due to the slope of the ground the lowest northerly edge of any structure would be approximately thirty-five feet above the ground. Some type of closure would be required.

d) It is assumed that the MWRA would not insist on the right to remove any structure if they found that the open area was not sufficient.

e) A 36 foot high, 2 level structure starting approximately 14 to 15 feet above Lyman Street (height required for truck access to the Langley Block) would provide 200 to 220 spaces plus the 25 or 30 spaces on the Lyman Street ROW.

f) A "closure" is necessary to present unauthorized access to the open area under the parking structure on the northerly side.

3. *Replace the existing aqueduct with a steel pipe within a "box culvert" then build a parking garage.*
   a) The 'box culvert" shaped structure must be of sufficient height and width that the steel pipe could be replaced in the future using minimum height equipment such as a modified forklift.
   b) Surface parking or a multi-level structure could be built over Lyman Street and the "box culvert".
   c) An eighteen-foot retaining wall would be required on the northerly side assuming that the lowest floor of a garage structure is on fill. If the lowest floor of the garage were structural, a "closure" would be required below the northerly side.
   d) Approximately 100 to 120 spaces on a surface lot are possible less the spaces eliminated for access to the Langley Block. Assuming that Lyman Street provides truck access to the Langley Block, a three level structure measured from Lyman Street's elevation would be 36 feet high and provide 300 to 360 spaces less those eliminated for curb cuts.

4. *Relocate the Fire Department Headquarters Building to the corner of Willow and Centre Streets. Purchase or take by eminent domain the building at the corner.*
   a) The entrance to the parking structure would be from Centre Street.
   b) Approximately 100 to 120 cars/level can be accommodated. A three level structure (30 feet in height measured from Centre Street) would provide 300 to 360 parking spaces. It is possible to place portions of the first parking level below grade.
   c) The MWRA aqueduct is not affected but portion of their property may be used.
   d) The parking structure is not well located to serve the Newton Centre shopping but would be suitable for employee parking.

ACTION:

1. The Newton Engineering Department will estimate the cost of a stone clad retaining wall behind the Fire Station and the cost of fill.
2. The Newton Engineering Department will identify the utilities below Lyman Street and determine if they can remain in place or require relocation if a structure is built over Lyman Street. An estimated cost of any relocation will be provided.
3. Ms. McAvoy will determine the width and height of the "box culvert" and provide an estimated cost of replacing the aqueduct with a steel pipe enclosed within the "box culvert".

July 24, 2007

RE: Meeting with MBTA
ON: July 17, 2007

1. Met with Mark Boyle, Director of Real Estate, Joseph Cosgrove, Director of Development/Planning and Gregory A. Dicovrisky (617-482-2525) who is involved with the planning and design elements of construction.
2. Representing the Newton Centre Task Force was Victoria Danberg, Alderman, Candace Havens, and K. E. Alexander. Also in attendance was Louis Taverna, City Engineer.
3. The purpose of the meeting was to determine if there were any impediments to construction over the MBTA tracks.
4. The NCTF members outlined the possibility of constructing a proportion of a parking structure over the MBTA tracks between Herrick Road and Cypress Street. Essentially half of the garage would be on City owner property (Cypress Street parking lot) and the other half over the MBTA property. Discussed was the possibility that the garage structure could be located north of the tracks, therefore not actually being over the active rail lines.
5. It was understood that the ideals were conceptual in nature and that detailed information would be required regarding the foundations/retaining walls on either side of the tracks, the design and layout of the garage, and access roads positioning.
6. The key impediments identified by the MBTA were:
   a) clearance over the track must be equal or exceed that provided by the Cypress Street bridge (18' 8" was mentioned),
   b) as built information on the retaining walls on either side of the tracks must be determined as no records of the construction exist,
   c) the MBTA would be receptive to working with the City, and
   d) Financial and use arrangements must be negotiated for the use of the air rights.
7. The MBTA expressed concern for adjacent neighbors and their desire to mitigate any negative impact, especially lighting. The NCTF members agreed.
8. Regarding the financial arrangements, the MBTA would be looking for fair market value, commuter parking, and/or 50% of net revenue.
9. Since Red Sox and Celtics fans park and ride, the parking fee structure for the garage would have to consider this evening use. This use also increases MBTA rider revenue.
10. The MBTA also mentioned that John Munet from Zussman's office had contacted them about the possibility of Townhouses with parking below over air rights between Langley Road and Herrick Road.

Memo for the Record

May 10, 2007

Alderman Vicki Danberg and Committee Member K. Edward Alexander met with Fire Chief Joseph LaCroix

3. Regarding raised crosswalks.
   a) The Chief had a drawing of a design that the Department would accept. The overall width is 20 feet and it is elevated 6 inches. There is a 6-foot slope, then an 8-foot level section, and a 6-foot slope. The level section is critical and could be wider.
   b) He felt that his equipment moved relatively slow in approaching and driving through Newton Centre. Therefore, the 6 inch elevated section described above would not be a problem. In other locations where his trucks are moving faster, the 6-inch rise may be a major problem.
   c) The raised crosswalk must be clearly marked --- yellow paint or something that his drivers can see at night and understand what they are approaching.
   d) Drainage is a concern. If the street slopes (and all of them do), storm water drain must be provided on one side so that 6 inches of water will not collect.
4. Regarding the Fire Station
   a) The "annex", the one story structure at the rear and side of the Station, houses the Ambulance Group's support facilities; the wire groups work shops, cable and supply storage, and equipment storage.
   b) He would like to add a second floor to the "annex" for the above uses.
   c) He would prefer that the Wire Section remain in close proximately to the Fire Department Headquarters for coordination and supervision. He could not suggest an alternative location. The Ambulance facility must remain, as it is an integral part of the operation.
   d) In general, the second floor of the Station (as in most Stations) requires total renovation. Some of the changes are due to the introduction of women fire fighters but the Station is a half-century old and all the systems (heating, electrical, water supply) require an upgrade if not replacement (visual inspection indicates that the windows are not energy efficient but they are not currently schedule for replacement). The first floor, other than the overhead door openings (equipment is taller), is adequate. A/C in the living quarters as well as the administrative area is a modern day requirement.
   e) Not surprisingly, a new station would be acceptable and he suggested a location in the Park across from the Headquarters Building. In other words, he requires a Newton Centre location but the Park is the only location owned by the City that could accommodate the Station.
   f) The Headquarters building continues to function but it is not ideal. I sensed that a new facility is on his dream list.

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

McMAHON ASSOCIATES
180 Canal Street | Suite 500 | Boston, MA 02114
p 617-725-0099 | f 617-725-0049
www.mcmtrans.com

PRINCIPALS
Joseph W. McMahon, P.E.
Rodney P. Plourde, Ph.D., P.E.
Joseph J. DeSantis, P.E., PTOE
John S. DePalma
William T. Steffens

ASSOCIATES
Casey A. Moore, P.E.
Gary R. McNaughton, P.E., PTOE
John J. Mitchell, P.E.
Christopher J. Williams, P.E.
John F. Yacapsin, P.E.

December 29, 2006

Ms. Theresa Park
Economic Development Director
Newton City Hall
City of Newton
1000 Commonwealth Avenue
Newton Centre, MA 02459

DRAFT

RE: Newton Centre Review
Preliminary Findings - Alternative 2 and Alternative 4
Newton, MA

Dear Ms. Park:

As requested, McMahon Associates, Inc. (McMahon) has evaluated two alternatives which were included in the initial findings of the Newton Centre Task Force in Newton, Massachusetts. *The Initial Findings Report of the Newton Centre Task Force* was prepared in March 2006 and summarizes the recommended potential changes to Newton Centre, including property use, design, traffic and parking, zoning, financing, and case studies. The following review focuses on specific traffic issues related to the two alternatives.

The first alternative, Alternative 2, includes the potential for two roundabouts along Beacon Street at Centre Street and Langley Street/Sumner Street. In order to asses the traffic conditions at these intersections, the existing peak hour traffic volumes collected by the City of Newton in October 2005 and shown in the attached figure were subjected to a detailed capacity/level-of-service analysis, as described below. Based on the results of the capacity/level of service analysis, McMahon has also prepared a concept plan that is attached.

The second alternative, Alternative 4, involves implementing a one-way traffic loop around the village center and includes modifications to traffic circulation in Newton Centre. We have performed intersection capacity/level-of-service analysis for this alternative using the existing October 2005 peak hour evening traffic volumes. The results of the analysis are included and discussed in further detail in the Alternative 4 - One-way Traffic Loop section included in this evaluation.

Alternative 2 – Roundabouts

Capacity Analysis Procedure

The capacity of a roundabout is determined separately for each approach. As stated in the Federal Highway Administration publication *Roundabouts: An Informational Guide,* the capacity of an approach "depends upon two factors: the circulating flow in the roundabout that conflicts with the entry flow, and the geometric elements of the roundabout." Furthermore, the most significant geometric elements are the entry width and the number of lanes on the roundabout approach.

McMahon utilized the RODEL (Roundabout DELay) software to analyze the existing 2005 peak hour traffic volumes to determine operating conditions for Alternative 2, which includes the potential for two roundabouts along Beacon Street at Centre Street and Langley Street/Sumner Street. RODEL uses empirical equations based on analysis of field measurements. Furthermore, since RODEL accounts for geometric properties, it is our opinion that RODEL will provide results closer to actual operations compared to other software options. To determine the level of service (LOS) for each approach, the average delay reported in RODEL, given in minutes, is converted to seconds, two seconds are added to account for geometric delay and the resultant delay is compared to the LOS criteria for signalized intersections contained in the "Highway Capacity Manual".

As the v/c ratio of a roundabout approach reaches 0.85, the sensitivity of capacity to geometric characteristics increases. Furthermore, there is a level of uncertainty in predicting intersection capacity at roundabouts. Most roundabout analysis models utilize only the most probable capacity, or the 50 percentile capacity. The uncertainty in capacity prediction results in uncertain v/c ratios and inaccurate prediction of capacity. In RODEL, the confidence level can be adjusted to reflect any percentile capacity. Accordingly, McMahon performed two separate analyses, one at a 50% confidence level and one at an 85% confidence level. The 50% confidence level analysis results were utilized to determine the delay for each approach. The 85% confidence level analysis results were utilized to verify that maximum queues do not exceed available storage or distance to an adjacent intersection.

Capacity Analysis Results

The results of the capacity/level-of-service analysis are illustrated in the attached figure for 2005 existing conditions for the weekday morning and weekday afternoon peak hours for both the Beacon Street at Langley Street and Sumner Street intersection and Beacon Street at Centre Street intersection. Additionally, the detailed capacity analysis worksheets are attached.

Beacon Street, Langley Street and Sumner Street

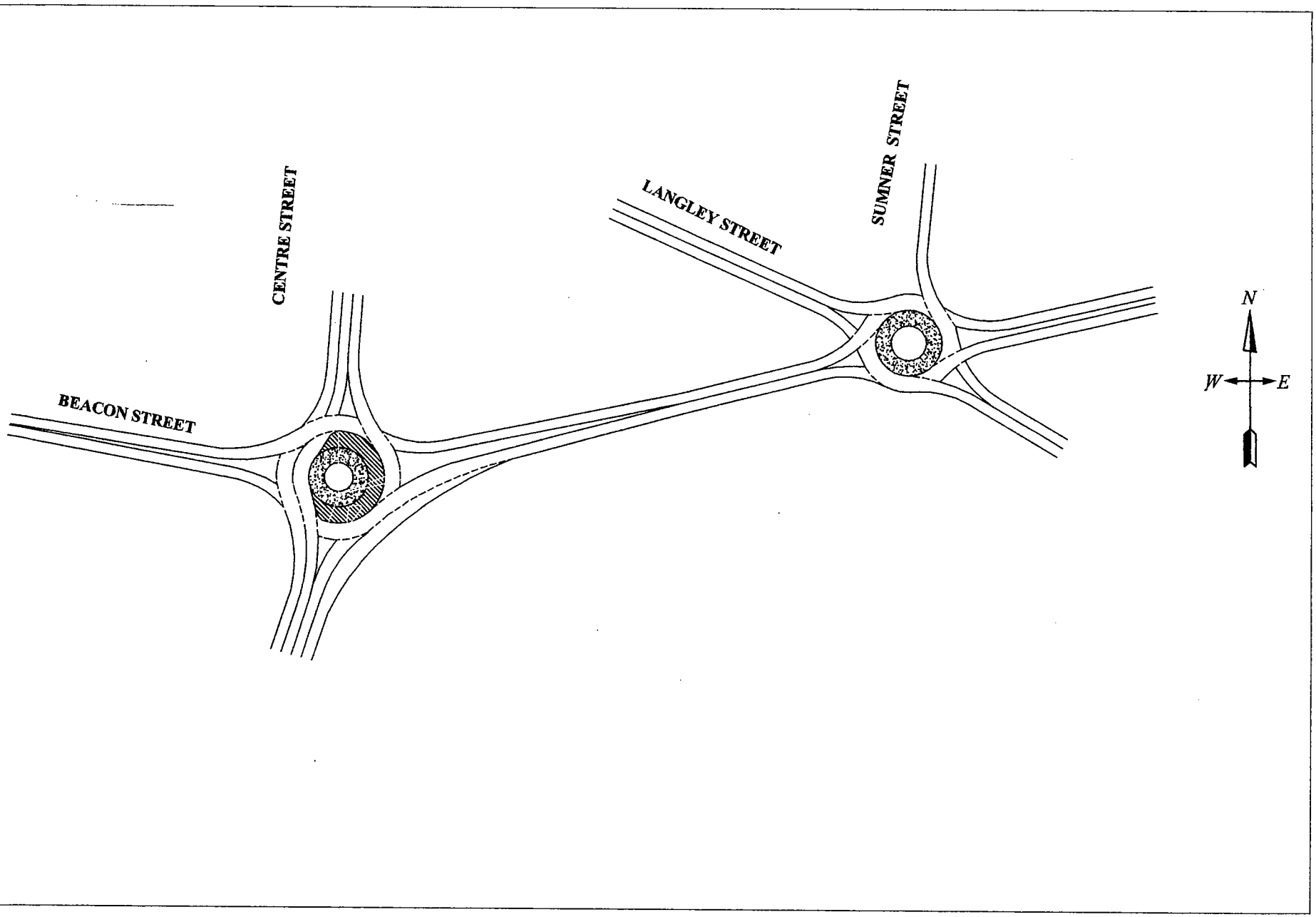
Based on the capacity analysis performed for the roundabout alternative, it is recommended that the Beacon Street, Langley Street and Sumner Street intersection provide single lanes on each approach. With this configuration, all movements at the Beacon Street, Langley Street and Sumner Street intersection will operate at LOS A or LOS B for both the 50% and 85% confidence levels during the weekday morning and weekday afternoon peak hours. As a comparison, previous analyses done by the City of Newton for the 2005 existing volumes for the Beacon Street, Langley Street and Sumner Street signalized intersection gave results showing LOS C for current conditions during both the weekday morning and weekday afternoon peak hours.

Beacon Street and Centre Street

In order to maximize operating conditions at the Beacon Street and Centre Street intersection, it is recommended to provide a single lane on each Beacon Street approach and two lanes on the southbound Centre Street approach. Additionally, considering the heavy traffic volumes traveling northbound on Centre Street and turning right onto Beacon Street, it is recommended the northbound Centre Street approach provide a single lane for left-turn and thru movements and a separate by-pass lane for right-turn movements. With this configuration, all movements at the Beacon Street and Centre Street intersection will operate at LOS C or better during the weekday morning and weekday afternoon peak hours. These results are favorable in comparison to the previous analysis done by the City of Newton which showed the existing Beacon Street and Centre Street signalized intersection to be operating at LOS E during both the weekday morning and weekday afternoon peak hours.

Concept Plan

The number of lanes required within the circulatory roadway of a roundabout is dictated by the number of lanes required at each approach. For example, if two lanes are required on all approaches, a full two-lane circulatory roadway within the roundabout is required. Accordingly, at the intersection of Beacon Street, Langley Street and Sumner Street, a single lane circulatory roadway is required as shown in the attached concept plan. At the intersection of Beacon Street and Centre Street, two lanes are required from the southbound Centre Street approach to the southbound Centre Street exit and a single lane is required throughout the remaining of the roundabout as shown on the attached concept plan.



SCALE
1"=150'

CITY OF NEWTON
ROUNDABOUT OPTION

Alternative 4 – One-way Traffic Loop around village center

Capacity Analysis Procedure

McMahon utilized the SYNCHRO capacity analysis software to analyze the existing 2005 peak hour traffic volumes to determine operating conditions for implementing a one-way traffic loop around the village center. Synchro is a complete software package for modeling and optimizing traffic signal timings. The key features of SYNCHRO include capacity analysis, coordination, actuated signals, and time-space diagrams. Furthermore, SYNCHRO provides a complete implementation of the Highway Capacity Manual and allows you to quickly analyze intersections and generate optimum timings to minimize delays given specific geometric conditions.

Capacity Analysis Results

The results of the capacity/level-of-service analysis are illustrated in the following table for 2005 existing conditions weekday afternoon peak hour for Alternative 4. Additionally, the detailed capacity analysis worksheets are attached for the Existing 2005 Alternative 4 .

Beacon Street/Centre Street
Weekday Afternoon Peak Hour

			Existing 2005			Existing 2005-Alt 4		
Intersection	**Movement**		**Los[1]**	**Delay[2]**	**V/C[3]**	**Los[1]**	**Delay[2]**	**V/C[3]**
Beacon Street/Centre Street	EB	L	C	33.6	0.37	NA	NA	NA
		T	NA	NA	NA	F	125.5	1.14
		TR	F	105.0	1.09	NA	NA	NA
		R	NA	NA	NA	A	7.4	0.37
	NB	L	NA	NA	NA	F	396.9	1.72
		LT	D	37.5	1.59	NA	NA	NA
		R	A	7.4	0.31	F	97.5	1.13
	SB	L	B	15.8	0.38	D	40.7	0.87
		T	C	22.5	0.76	F	468.6	1.98
		R	A	8.7	0.07	NA	NA	NA
	Overall		***E***	***55.7***	***1.54***	***F***	***233.9***	***1.98***
Beacon Street/Sumner Street/ Langley Road	EB	L	NA	NA	NA	B	16.5	0.81
		TR	NA	NA	NA	B	11.4	0.71
		LTR	B	17.6	0.62	NA	NA	NA
	WB	L	NA	NA	NA	A	9.6	0.35
		R	NA	NA	NA	A	7.5	0.65
		LTR	C	29.7	0.91	NA	NA	NA
	NW	L	C	34.5	0.48	NA	NA	NA
		R	D	46.3	0.69	D	42.3	0.71
	Overall		***C***	***30.1***	***0.91***	***B***	***14.6***	***0.81***

The existing signalized intersection timings have been optimized to incorporate modified lane geometries due to shifting from two-way to one-way travel on specific roadways, including Centre Street between Beacon Street and Sumner Street, Beacon Street between Langley Road and Centre Street, and making Sumner Street one way from Beacon Street to Centre Street. With this configuration and the redistribution of traffic volumes, the overall intersection at the Beacon Street and Centre Street intersection becomes LOS F due to several failing approaches. Previous analysis performed by the City of Newton determined that the existing intersection operates at LOS E during the evening peak hour which shows a drop in performance with the redistribution of traffic volumes under this alternative.

Conclusion

McMahon has evaluated the feasibility of a roundabout at the intersections of Beacon Street/Centre Street and Beacon Street/Langley Street/Sumner Street, Alternative 2, and also a one-way loop around the Newton Centre village center, Alternative 4.

Based solely on the results of the capacity/level-of-service analysis for Alternative 2, it is recommended that a single lane roundabout be provided at the Beacon Street/Langley Street/Sumner Street intersection. Under existing conditions, a single lane roundabout at this intersection will operate at acceptable levels of service during both peak periods studied. Furthermore, it is recommended that a roundabout with mostly a single lane circulatory roadway be provided at the Beacon Street/Centre Street intersection. In order to accommodate traffic on the southbound Centre Street approach, two lanes should be provided at this approach and within the roundabout from the southbound Centre Street approach to the southbound Centre Street exit. Additionally, at the northbound Centre Street approach, a separate lane should be provided to accommodate heavy right-turn movements. This configuration will allow for a single exit lane on the northern Centre Street leg. Under existing conditions, this roundabout alternative will operate at acceptable levels of service during both peak studied at the Beacon Street/Centre Street approach.

The initial analysis conducted for Alternative 4 or the one-way loop around the village center, shows that operational problems occur at the Beacon Street and Centre Street signalized intersection. Specifically, the overall level of service at the intersection is worsened with the redistribution of the traffic volumes with this configuration and is not an improvement to traffic operations at this location.

We look forward to working with you to discuss these issues further. If you should have any further questions or require further information, please feel free to call.

Sincerely,

Steven C. Findlen
Project Manager